

Asking Questions: The Scientific Method

The **scientific method** is a systematic approach to solving problems. Professional scientists are not the only people to use this approach. It is a method you use every day to solve problems, from deciding what to wear to figuring out a new video game.

There are 7 steps to the scientific method:

- ❖ State the problem
 - Before one can solve a problem, he/she must understand what the problem is and be able to state it.
 - b. To understand a problem and find the best answers, you must ask the right questions:
Who? What? When? Where? Why? How?
 - c. One of the hardest steps of the scientific method
- ❖ Make observations—gather information on the problem.
 - Ask Who? What? When? Where? Why? How?
- ❖ Form a hypothesis
 - hypothesis-
- ❖ Experiment to test the hypothesis
 - Every experiment has 2 groups
 - Variable group-
 - Independent variable
 - Dependent variable
 - Control group
- ❖ Record and analyze data
 - Use graphs, tables, charts, etc.
- ❖ State conclusion
- ❖ Repeat the work/share results

Scientific Method

Group Assignment

Part I. Answer the following questions on a separate sheet of paper.

1. List the 7 steps of the scientific method in order AND give a one sentence explanation of each.
2. Before proposing a hypothesis, what 2 steps must a scientist take?
3. How does a scientist test a hypothesis?
4. What is a variable?
5. What two groups does every well designed experiment have?
6. What are some ways data is recorded and analyzed?
7. Why is the work repeated?
8. Is the scientific method always so orderly?
9. Explain what bias is and how it can affect the results of an experiment.

Part II.

You are a doctor and you specialize in stomach cancer. Over the last several years, you have noticed that patients who drink Diet Coke seem to recover more quickly and have less severe cases of stomach cancer. You want to conduct a formal scientific study to determine if this might be true. Using the steps of the scientific method do the following:

1. What is your problem?
2. What sources would you use to gather information?
3. State a hypothesis.
4. Design an experiment to test your hypothesis. In your experiment, **CLEARLY** identify **variable group**, **control group**, **independent variable**, and **dependent variable**.